

CLAIMS

What is claimed is:

- 1 1. A method for producing an ultrasound image, comprising:
2 generating ultrasound at a frequency of at least 20 megahertz (MHz);
3 transmitting ultrasound at a frequency of at least 20 MHz into a subject;
4 receiving ultrasound from the subject;
5 processing the received ultrasound to provide an image having an effective
6 frame rate of at least 200 frames per second (fps) using scan line based image
7 reconstruction.

- 1 2. The method of claim 1, further comprising generating ultrasound in a
2 frequency range of about 20MHz to 60MHz.

- 1 3. The method of claim 1, further comprising using the ultrasound on a
2 small animal to image rapidly moving anatomy.

- 1 4. The method of claim 3, wherein the small animal is a mouse.

- 1 5. The method of claim 1, further comprising using the ultrasound on a
2 small animal to image blood flow.

- 1 6. The method of claim 5, wherein the small animal is a mouse.

- 1 7. The method of claim 1, further comprising:
2 generating a plurality of scan lines, each scan line generated at a specific
3 location and offset in time from a reference point of an ECG rhythm.

1 8. The method of claim 7, further comprising:
2 assembling the plurality of scan lines based on the location and the point in
3 time offset from the reference point.

1 9. A system for developing an ultrasound image, comprising:
2 a scan head having a transducer capable of generating ultrasound energy at a
3 frequency of at least 20 megahertz (MHz); and
4 a processor for receiving ultrasound energy and for generating an ultrasound
5 image at an effective frame rate of at least 200 frames per second (fps) using scan
6 line based image reconstruction.

1 10. The system of claim 9, wherein the ultrasound occurs at a frequency
2 range of about 20MHz to 60MHz.

1 11. The system of claim 9, wherein the ultrasound is performed on a
2 small animal to image rapidly moving anatomy.

1 12. The system of claim 9, wherein the ultrasound is performed on a
2 small animal to image blood flow.

1 13. The system of claim 10, further comprising:
2 a transmit subsystem configured to generate a plurality of scan lines, each
3 scan line generated at a specific location and offset in time from a reference point of
4 an ECG rhythm.

1 14. The system of claim 10, further comprising:
2 an image reconstruction subsystem configured to assemble the plurality of
3 scan lines based on the location and the point in time offset from the reference point.

1 15. A system for producing an ultrasound image, comprising:
2 means for generating ultrasound at a frequency of at least 20 megahertz
3 (MHz);
4 means for transmitting ultrasound at a frequency of at least 20 MHz into a
5 subject;
6 means for receiving ultrasound from the subject; and
7 means for processing the received ultrasound to provide an image having an
8 effective frame rate of at least 200 frames per second (fps) using scan line based
9 image reconstruction.

1 16. The system of claim 15, further comprising means for generating
2 ultrasound in a frequency range of about 20MHz to 60MHz.

1 17. The system of claim 15, further comprising means for generating a
2 plurality of scan lines, each scan line generated at a specific location and offset in
3 time from a reference point of an ECG rhythm.

1 18. The system of claim 17, further comprising means for assembling the
2 plurality of scan lines based on the location and the point in time offset from the
3 reference point.

1 19. A method for producing an ultrasound image, comprising:
2 generating ultrasound in a frequency range of 20-60 megahertz (MHz);
3 transmitting the ultrasound into a small animal;
4 receiving the ultrasound from the small animal;
5 processing the received ultrasound to provide an image having an effective
6 frame rate of at least 200 frames per second (fps) using scan line based image
7 reconstruction to image rapidly moving anatomy, wherein the processing further
8 comprises:

9 generating a plurality of scan lines, each scan line generated at a
10 specific location and offset in time from a reference point of an ECG rhythm; and

11 assembling the plurality of scan lines based on the location and the
12 point in time offset from the reference point.

1 20. A method for producing an ultrasound image, comprising:
2 generating ultrasound in a frequency range of 20-60 megahertz (MHz);
3 transmitting the ultrasound into a small animal;
4 receiving the ultrasound from the small animal;
5 processing the received ultrasound to provide an image having an effective
6 frame rate of at least 200 frames per second (fps) using scan line based image
7 reconstruction to image blood flow, wherein the processing further comprises:

8 generating a plurality of scan lines, each scan line generated at a
9 specific location and offset in time from a reference point of an ECG rhythm; and

10 assembling the plurality of scan lines based on the location and the
11 point in time offset from the reference point.

1 21. A system for developing an ultrasound image, comprising:
2 a scan head having a transducer capable of generating ultrasound energy in a
3 frequency range of 20-60 megahertz (MHz);
4 a processor for receiving ultrasound energy and for generating an ultrasound
5 image at an effective frame rate of at least 200 frames per second (fps) using scan
6 line based image reconstruction;
7 a transmit subsystem configured to generate a plurality of scan lines, each
8 scan line generated at a specific location and offset in time from a reference point of
9 an ECG rhythm; and
10 an image reconstruction subsystem configured to assemble the plurality of
11 scan lines based on the location and the point in time offset from the reference point.

1 22. A system for producing an ultrasound image, comprising:
2 means for generating ultrasound in a frequency range of 20-60 megahertz
3 (MHz);
4 means for transmitting the ultrasound into a subject;
5 means for receiving ultrasound from the subject;
6 means for processing the received ultrasound to provide an image having an
7 effective frame rate of at least 200 frames per second (fps) using scan line based
8 image reconstruction, wherein the means for processing comprises:
9 means for generating a plurality of scan lines, each scan line
10 generated at a specific location and offset in time from a reference point of an ECG
11 rhythm; and
12 means for assembling the plurality of scan lines based on the location
13 and the point in time offset from the reference point.